

02/05/14 Agenda:

- Warm Up Problem
- Review Homework
 - Worksheet 7 - Find Missing Sides
- Section 7.7
 - Inverse Trig Ratios - Find Missing Angles
- Homework
 - Worksheet 8 - Find Missing Angles

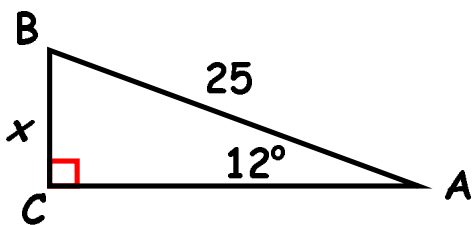
Warm Up - Homework Out!

Everybody get a calculator, set it to degree mode, then find the following values. Round to 3 decimals:

$$\cos 72^\circ .309 \quad \sin 19^\circ .326 \quad \tan 50^\circ 1.192$$

$$\cos 27^\circ .891 \quad \sin 84^\circ .995 \quad \tan 23^\circ .424$$

Find the missing side:



$$x = 5.198$$

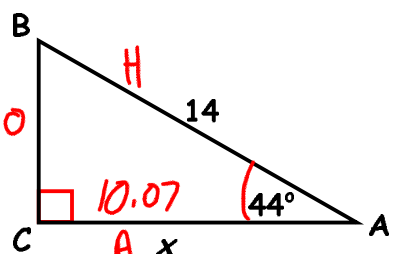
Section 7.7 - Inverse Trig Functions - Find Missing Angles

Target 7E

February 5, 2014

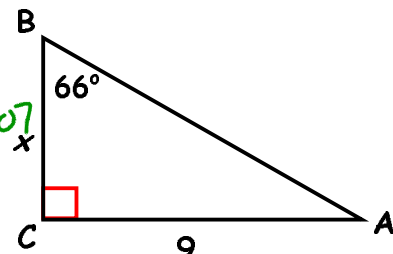
Goal: Use inverse sine, inverse cosine, and inverse tangent ratios to find the missing angles of a right triangle.

Review: Find the missing side length of the triangle. Round your answer to 3 decimal places.



$\angle A = 44^\circ$
 $HYP = 14$
 $ADJ = x$
 $\cos \angle A = \frac{ADJ}{HYP}$
 $\cos 44^\circ = \frac{x}{14}$
 $14 \cdot \cos 44^\circ = x$
 $x = 10.07$

$S = \frac{O}{H}$
 $C = \frac{A}{H}$
 $T = \frac{O}{A}$



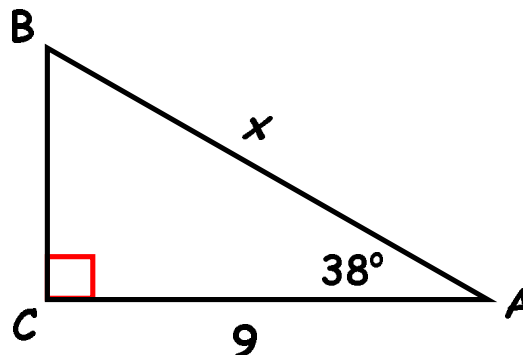
$\angle B = 66^\circ$
 $OPP = 9$
 $ADJ = x$
 $\tan \angle A = \frac{OPP}{ADJ}$
 $\tan 66^\circ = \frac{9}{x}$
 $x = \frac{9}{\tan 66^\circ}$
 $x = 4.007$

Section 7.7 - Inverse Trig Functions - Find Missing Angles

February 5, 2014

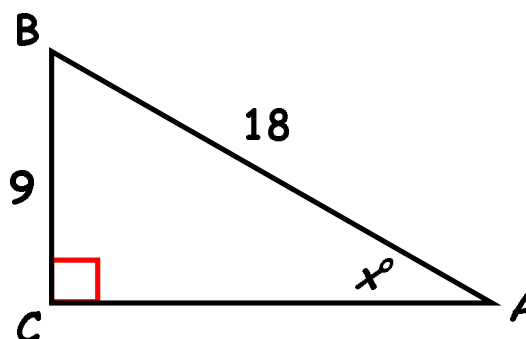
Target 7E

Yesterday, we learned how to use sine, cosine, and tangent to find the missing side of a right triangle.



Today, we're going to figure out the angle measures using *inverse trig ratios*.

Find the measure of angle A. Round your answer to 1 decimal place.



\sin ,
 \cos ,
 \tan

If we have an angle measure, the sine, cosine, and tangent functions will tell us the ratio of the sides.

\sin^{-1} ,
 \cos^{-1} ,
 \tan^{-1}

If we have the ratio of the sides, *inverse trig functions* will tell us the angle measure.

Section 7.7 - Inverse Trig Functions - Find Missing Angles

Target 7E

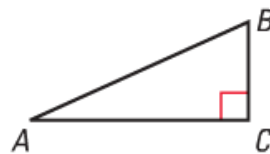
February 5, 2014

KEY CONCEPT

For Your Notebook

Inverse Trigonometric Ratios

Let $\angle A$ be an acute angle.



Inverse Tangent If $\tan A = x$, then $\tan^{-1} x = m\angle A$.

$$\tan^{-1} \frac{BC}{AC} = m\angle A$$

Inverse Sine If $\sin A = y$, then $\sin^{-1} y = m\angle A$.

$$\sin^{-1} \frac{BC}{AB} = m\angle A$$

Inverse Cosine If $\cos A = z$, then $\cos^{-1} z = m\angle A$.

$$\cos^{-1} \frac{AC}{AB} = m\angle A$$

Let's try something:

On your calculator,

find $\sin 30^\circ$ 0.5

Now find $\sin^{-1} 0.5$ 30

Try $\cos 72^\circ$ 0.309

and $\cos^{-1} 0.309$ 72.001

Finally $\tan 50^\circ$ 1.192

and $\tan^{-1} 1.192$ 50.0058

Section 7.7 - Inverse Trig Functions - Find Missing Angles
Target 7E

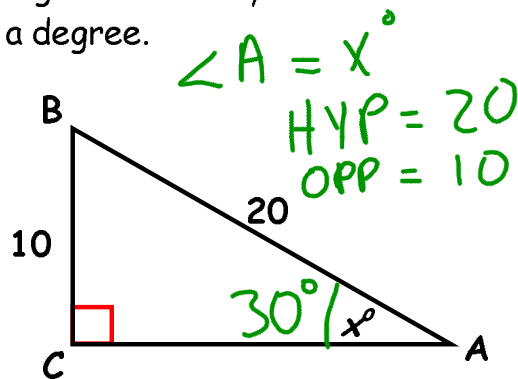
February 5, 2014

Example 1: Find the measure of angle A. Round your answer to the nearest tenth of a degree.

$$\sin \angle A = \frac{\text{OPP}}{\text{HYP}}$$

$$\sin X = \frac{10}{20}$$

$$\sin^{-1}\left(\frac{10}{20}\right) = X \quad X = 30^\circ$$

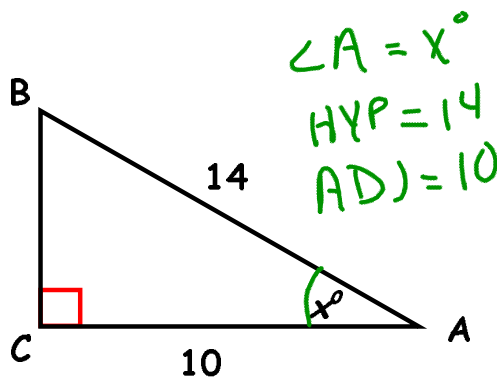


Example 2:

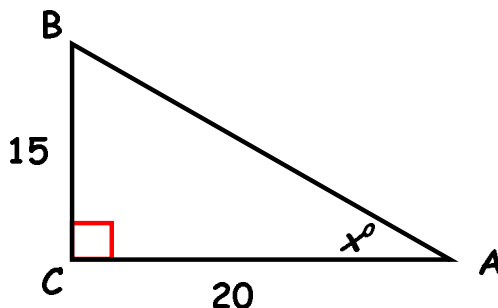
$$\cos \angle A = \frac{\text{ADJ}}{\text{HYP}}$$

$$\cos X = \frac{10}{14}$$

$$\cos^{-1}\left(\frac{10}{14}\right) = X \quad X = 44.4^\circ$$



Example 3:



Section 7.7 - Inverse Trig Functions - Find Missing Angles

Target 7E

February 5, 2014

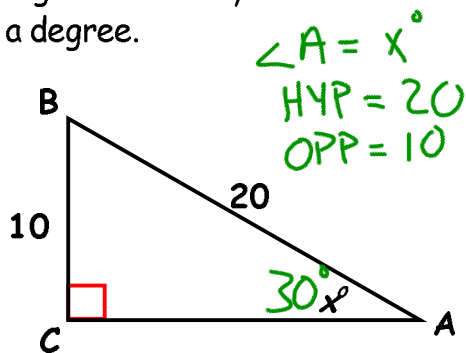
Example 1: Find the measure of angle A. Round your answer to the nearest tenth of a degree.

$$\sin \angle A = \frac{\text{OPP}}{\text{HYP}}$$

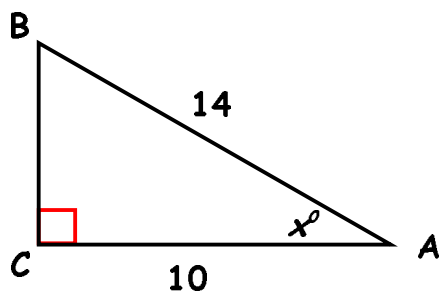
$$\sin X = \frac{10}{20}$$

$$\sin^{-1}\left(\frac{10}{20}\right) = X$$

$$X = 30^\circ$$



Example 2:



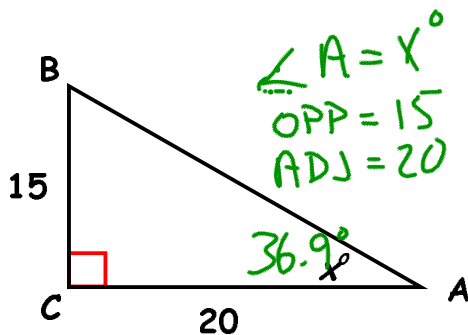
Example 3:

$$\tan \angle A = \frac{\text{OPP}}{\text{ADJ}}$$

$$\tan X = \frac{15}{20}$$

$$\tan^{-1}\left(\frac{15}{20}\right) = X$$

$$X = 36.9^\circ$$



Section 7.7 - Inverse Trig Functions - Find Missing Angles

Target 7E

February 5, 2014

You try: Use your calculator to approximate the measure of angle A to the nearest tenth of a degree.

